

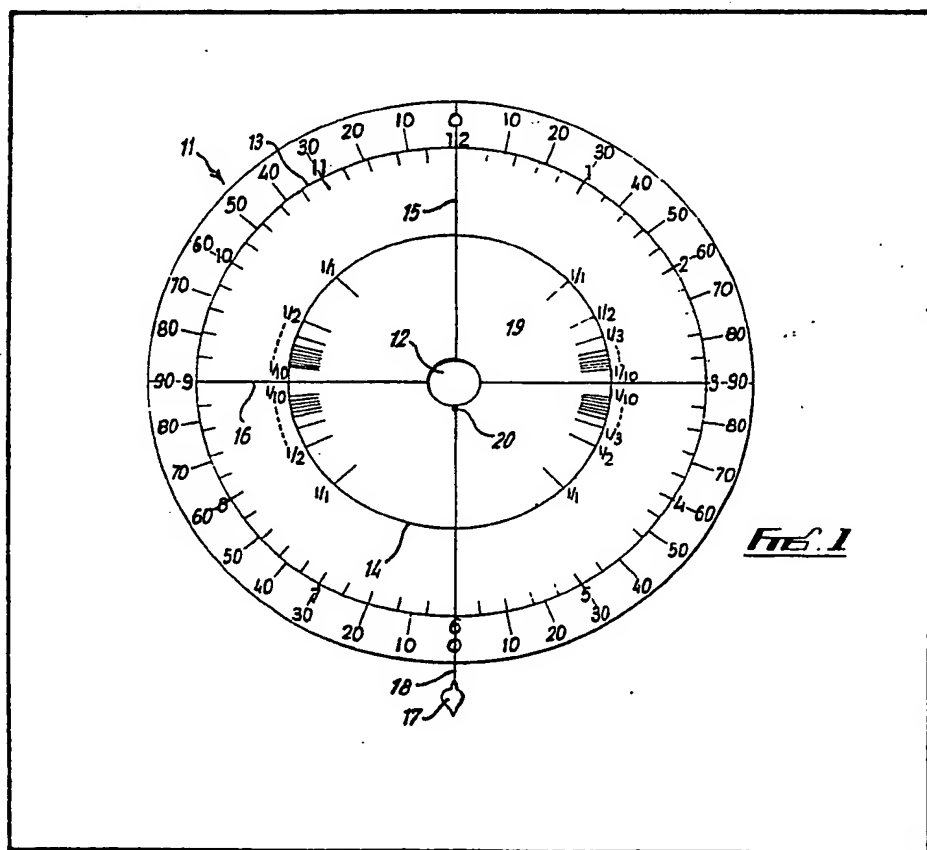
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GB 1480656
GB 1352588
GB 1163320
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(54) Levels

(57) A device for measuring angles and inclinations in connection with the game of golf comprises a substantially flat, transparent plate (11), preferably circular having markings (13, 14, 15, 16, 19) thereon and a plumb line (17, 18) or a spirit level attached to the plate (11) and adapted to determine the relative disposition of the markings (15, 16) to the vertical. The markings comprise datum lines (15, 16) extending mutually

perpendicularly across a face of the plate (11) and being diameters of a circular scale (13), a gradient scale (19) related to the datum line (16) and markings of 0° to 90°. The plate 11 has a central aperture (12) therein and has substantial light transmission inhibiting properties to reduce glare in use. Transparent pointers (29) each having a radial line (31) inscribed thereon are attached to each face of the plate (11) for rotation about a perpendicular axis through the intersection of the datum lines (15, 16).



The drawing originally filed was informal and the print here reproduced is taken from a later filed formal copy.

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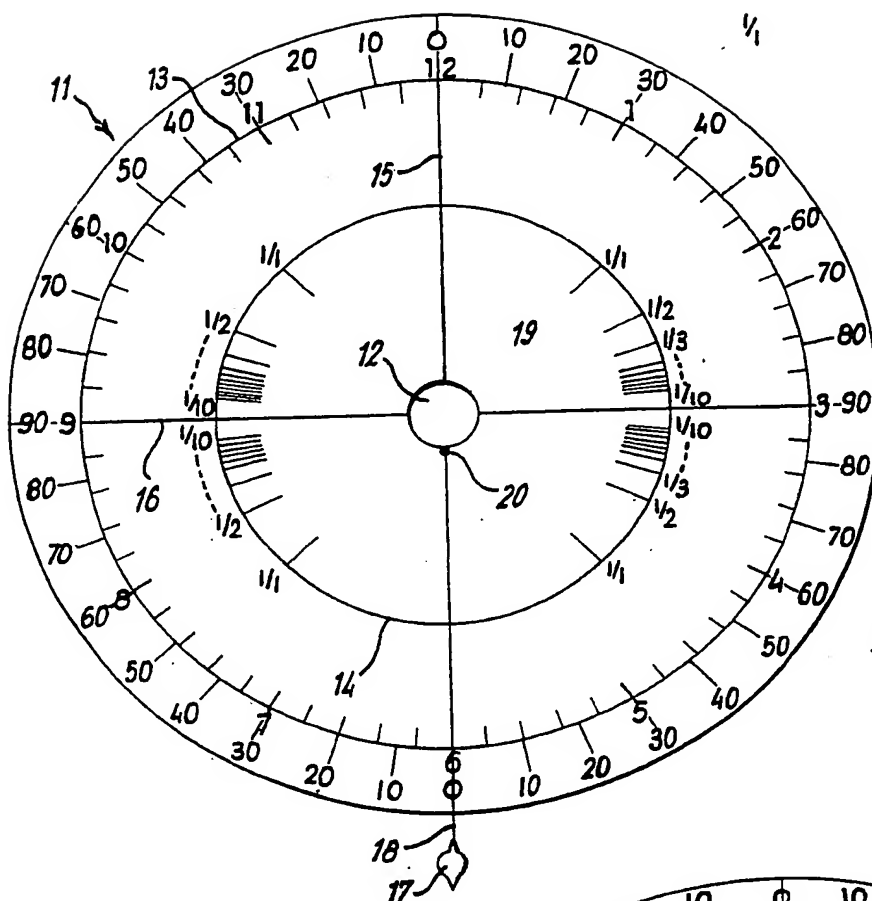


FIG. 1

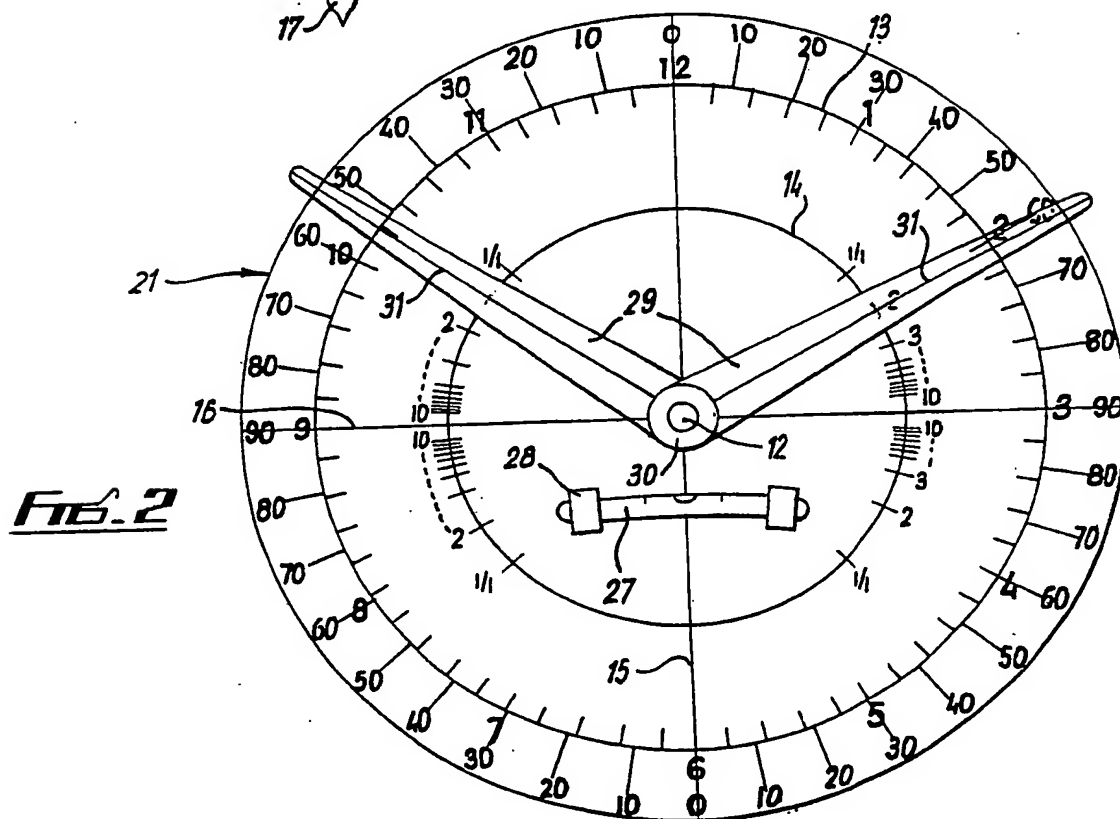


FIG. 2

SPECIFICATION

Device for Use in Connection With the Game of Golf

5 The invention relates to a device for use in connection with the game of golf.

In teaching or playing the game of golf the need frequently arises for an estimate to be made of various angles or of the inclinations of surfaces. Conventionally such angles or inclinations are judged solely by the eye in a qualitative rather than a quantitative manner, and are accordingly frequently inaccurate. Furthermore, the quantitative manner of assessment precludes realistic comparisons between the assessments made on different occasions.

15 The object of the present invention is to provide a device which will allow of a quantitative assessment of various angles or inclinations, and thus allow of a comparison between assessments.

20 According to the invention there is proposed a device for use in connection with the game of golf which comprises a substantially flat, transparent plate having markings thereon and means attached to said plate and adapted to determine the relative disposition of said markings to the vertical.

30 The disposition determining means may comprise a plumb line or a spirit level. The markings may include a first datum line extending across a face of the plate and in the former case the plumb line may be attached to the plate on that datum line adjacent the centre thereof, whilst in the latter case the spirit level may be attached to the plate transversely of the datum line and preferably disposed symmetrically thereof. The markings may include a second datum line extending across the face of the plate transversely of and intersecting the first datum line. A gradient scale may be marked on the plate related to the second datum line and a circular scale of which the datum lines are diameters may also be marked thereon.

45 A pointer may be attached to the device so as to be rotatable about an axis perpendicular to the plate and passing through the intersection of the datum lines and preferably two such pointers may be attached, one on each side of the plate. The or each pointer is preferably of the same transparent material as the plate and has a radial line marked thereon.

50 Preferably each of the quadrants of the said circular scale formed by the diameters is marked from 0° to 90° from the first datum line outwardly, and the gradient scale is provided in each quadrant and is related to the centre of the said circular scale.

60 The plate is preferably circular, in which case the datum lines form diameters thereof, and the plate may have a centrally disposed aperture therein. The plate may also have substantial light transmission inhibiting properties whereby in use glare is reduced.

The invention will now be described further, by

65 way of example only, with reference to the accompanying drawing in which Figures 1 and 2 illustrate two embodiments thereof in diagrammatic front elevation.

Referring now to Fig. 1 the device consists of a 70 circular disc 11 made from transparent material and ten of twelve centimetres in diameter. A hole 12 in the centre allows the user to sight the disc on a particular object or spot. Within the circumference is described a circle 13 of up to ten centimetres in diameter, the space between the circumference and the circle being calibrated into degrees and clock hours and minutes. The quadrant represented as being from 12 o'clock to 3 o'clock is marked with degrees from 0 to 90, whilst the quadrant from 3 o'clock to 6 o'clock is marked with degrees from 90 to 0. Similarly, the quadrant 6 o'clock to 9 o'clock is marked with degrees from 0 to 90 and the quadrant 9 o'clock to 12 o'clock is marked with degrees from 90 to 0. A smaller concentric circle 14, approximately 85 six centimetres in diameter is engaged. Heavy lines mark the 12 o'clock 6 o'clock line (the first datum or vertical line 15) and the 9 o'clock 3 o'clock line the second datum or horizontal (the level line 16). A weight 17, suspended by a cord 18 attached to the disc 11 at a point 20 below the horizontal datum line 16, hangs below the 6 o'clock mark, and may be used to locate the disc in a vertical disposition with the 12 o'clock mark uppermost. On arcs 14 radial marks are made which represent gradients from $1/1$, $1/2$, $1/3$, $1/4$, $1/5$ respectively, above and below the horizontal datum line 16.

Referring now to Fig. 2 there is shown a disc 100 21 which is similarly marked to that of Fig. 1. In this embodiment a spirit level 27 is attached to the disc 21 by means of a sleeve or lugs 28 preferably of a plastics material, the latter being attached to the disc 21 by adhesive or being formed integrally therewith in the preferred case of the disc being of a plastics material also. The spirit level 27 is disposed symmetrically of the first datum line 15 and perpendicular thereto, and preferably comprises a curved tube having its convex outer surface facing the 12 o'clock position on the disc 21.

110 Attached to the disc 21 on opposite faces thereof are two pointers 29, which are attached by means of a hollow rivet 30 passing through the centre of the disc 21. A radial line 31 is inscribed on each pointer 29 and the pointers are preferably made of the same transparent plastics material as the disc 21. In this way a surface whose inclination is to be determined may be aligned with the line on the pointer and the inclination may then be read in terms of degrees, clock time or tangent ratio as desired.

125 Due to the friction at the rivet 30 if one pointer 29 is moved the other pointer 29 will move also unless restrained. In this way the pointers may be arranged so that one inscribed line 31 is a continuation of the other or alternatively the inclination of one surface relative to another, for example the two arms of a golfer or an arm and

the club, may be read directly by aligning one pointer 29 with each surface.

Obviously the pointers shown in Figure 2 may be incorporated into the embodiment of Figure 1.

The disc is intended to be used in the four planes of reference frontal, rear, profile right and profile left, and in all intermediate planes. To assist the teaching and theory of the game the disc can be sighted on the ball, the club head, the hands of the pupil, or any part of his anatomy, using all possible planes of reference and thus all relevant angles can be checked and taught.

On the tee the disc can be sighted up the fairway and any gradient or slope which will effect the roll of the ball can be accurately measured and allowed for in the drive.

In a hazard the disc can be sighted on the ball and the gradient which has to be overcome to lift the ball over the edge of the hazard can be accurately ascertained. Indeed, it may well be that iron clubs will in future be designated according to the degrees of gradient they are required to overcome.

On the green the disc can be sighted from the ball to the hole and also from the hole to the ball in all possible planes of reference. Thus the slope or gradient of the putting green can be measured in relation to the horizontal with accuracy, and appropriate allowance made in lining up the putt.

Using the disc in the home during a television projection of a game of golf, the disc can be sighted as for other parts of the course, as previously mentioned. The pictures provided by the television authorities are invariably shown from several planes of reference, and the viewer is assured of increased interest in watching the game being played, and in the comfort of his own home.

The invention is not limited to the exact features of the embodiment herein disclosed, since alternatives will readily represent themselves to one skilled in the art. Thus, for example, whilst the device will preferably comprise a circular disc as herein disclosed, other shapes may be preferred in some instances. Furthermore, the device need not comprise a flat plate, although a plate of planar form is preferred.

The marking comprising the circle 14 may be omitted if desired, such omission having the advantage of reducing the number of lines appearing on the device and providing for a "cleaner" appearance thereof, or alternatively, arcs of circle 14 may be engraved instead of the complete circle, the arcs extending through angles of 45° above and below the horizontal line 16. As a further alternative the scales indicated may be marked in other ways, or further scales may be marked thereon, giving inclinations in terms of, say % gradient, radian or other units as desired.

Claims

1. A device for use in connection with the game of golf comprising a substantially flat, transparent plate having markings thereon and

means attached to said plate and adapted to determine the relative disposition of said marking to the vertical.

2. A device according to Claim 1 wherein said disposition determining means comprises a plumb line.

3. A device according to Claim 1 wherein said disposition determining means comprises a spirit level.

4. A device according to any one of the preceding claims wherein said markings include a first datum line extending across a face of said plate.

5. A device according to Claim 4 when dependent upon Claim 2 wherein said plumb line is attached to said plate on said first datum line adjacent the centre thereof.

6. A device according to Claim 4 when dependent upon Claim 3 wherein said spirit level is attached to said plate transversely of said first datum line.

7. A device according to Claim 6 wherein said spirit level is disposed symmetrically of said first datum line.

8. A device according to any one of Claim 4 to 7 wherein said markings include a second datum line extending across said face of said plate transversely of and intersecting said first datum line.

9. A device according to Claim 8 wherein said markings further include a gradient scale related to said second datum line.

10. A device according to Claim 8 or Claim 9 wherein said markings further include a circular scale of which said datum lines are diameters.

11. A device according to Claim 10 wherein each of the quadrants of said circular scale formed by said diameters is marked to indicate angles from 0° to 90° measured from said first datum line.

12. A device according to any one of Claims 8 to 11 wherein said plate is circular and said datum lines are diameters thereof.

13. A device according to any one of Claims 8 to 12 wherein said plate has an aperture therethrough having a centre coincident with the intersection of said datum lines.

14. A device according to any one of Claims 8 to 13 comprising a pointer attached to said plate for rotational movement about an axis perpendicular to said plate and passing through the intersection of said datum lines, said pointer having a radial line marked thereon.

15. A device according to Claim 14 comprising two like pointers attached to said disc for rotational movement about said axis, the pointers being on opposed faces of said disc.

16. A device according to Claim 14 or Claim 15 wherein each pointer and the radial line inscribed thereon extends to the periphery of the plate whereby the radial line intersects each one of a plurality of scales marked on the plate and an inclination reading may be taken from any one of all simultaneously, of such scales.

17. A device according to any one of Claims 14

to 16 wherein the or each pointer is of transparent material.

18. A device according to any one of the preceding claims wherein said plate has substantial light transmission inhibiting properties whereby in use glare is reduced.

19. A device for use in connection with the game of golf substantially as hereinbefore described with reference to and as illustrated in Fig. 1 or Fig. 2 of the accompanying drawing.

New Claims or Amendments to Claims filed on 26 Feb. 1980.

Superseded Claims 1 to 19.

New or Amended Claims:—

1. A device for use in connection with the game of golf comprising a substantially flat, transparent plate having markings thereon and a spirit level attached to said plate so as to determine the relative disposition of said marking to the vertical.

2. A device according to Claim 1 wherein said markings include a first datum line extending across a face of said plate.

3. A device according to Claim 2 wherein said spirit level is attached to said plate transversely of said first datum line.

4. A device according to Claim 3 wherein said spirit level is disposed symmetrically of said first datum line.

5. A device according to any one of Claims 2 to 4, wherein said markings include a second datum line extending across said face of said plate transversely of and intersecting said first datum line.

6. A device according to Claim 5, wherein said markings further include a gradient scale related to said second datum line.

7. A device according to Claim 5 or Claim 6 wherein said markings further include a circular

scale of which said datum lines are diameters.

8. A device according to Claim 7 wherein each of the quadrants of said circular scale formed by said diameters is marked to indicate angles from 0° to 90° measured from said first datum line.

9. A device according to any one of Claims 5 to 8, wherein said plate is circular and said datum lines are diameters thereof.

10. A device according to any one of Claims 5 to 9, wherein said plate has an aperture therethrough having a centre coincident with the intersection of said datum lines.

11. A device according to any one of Claims 5 to 10, comprising a pointer attached to said plate for rotational movement about an axis perpendicular to said plate and passing through the intersection of said datum lines, said pointer having a radial line marked thereon.

12. A device according to Claim 11 comprising two like pointers attached to said disc for rotational movement about said axis, the pointers being on opposed faces of said disc.

13. A device according to Claim 11 or Claim 12 wherein each pointer and the radial line inscribed thereon extends to the periphery of the plate whereby the radial line intersects each one of a plurality of scales marked on the plate and an inclination reading may be taken from any one, or all simultaneously, of such scales.

14. A device according to any one of Claims 11 to 13, wherein the or each pointer is of transparent material.

15. A device according to any one of the preceding claims wherein said plate has substantial light transmission inhibiting properties whereby in use glare is reduced.

16. A device for use in connection with the game of golf substantially as hereinbefore described with reference to and as illustrated in Fig. 2 of the accompanying drawing.